Is labor flexibility a substitute to offshoring? Evidence from Italian manufacturing

International Economics ▮ (▮▮▮▮) ▮▮▮–▮▮▮

Contents lists available at ScienceDirect

International Economics

journal homepage: www.elsevier.com/locate/inteco

Is labor flexibility a substitute to offshoring? Evidence from Italian manufacturing

Andrea F. Presbitero [a,*], Matteo G. Richiardi [b,c], Alessia A. Amighini [d]

[a] Universita' Politecnica delle Marche and MoFiR, Italy
[b] INET and Nuffield College, University of Oxford, UK
[c] Collegio Carlo Alberto, Italy
[d] Università del Piemonte Orientale, Italy

ARTICLE INFO

JEL classification:
J21
F16
F23

Keywords:
Offshoring
Labor flexibility
Temporary work
Delocalization
Labor market reforms

ABSTRACT

We test whether labor flexibility acts as a substitute to delocalization. Using Italian survey data, we show that a higher share of temporary workers appears to reduce the likelihood of future offshoring. However, once reverse causality and spurious correlation are controlled for with IV techniques, the relationship vanishes. This finding suggests that a solid argument that labor flexibility and offshoring are substitutes has still to be made.

1. Introduction

> "Once again, the key to turning the single market and globalization into opportunities is the capacity to reform labor market and social policies in the right direction. Failing to do so would only exacerbate the fear towards 'Polish plumbers' and delocalization" (Sapir, 2006).

The link between globalization and labor market regulations goes widely undisputed in the literature and in the public debate. As the story goes, in a globalized world domestic employment protection legislation becomes too costly, causing firms either to succumb to their international

* Corresponding author.
E-mail addresses: a.presbitero@univpm.it (A.F. Presbitero), matteo.richiardi@maths.ox.ac.uk (M.G. Richiardi), Alessia.amighini@eco.unipmn.it (A.A. Amighini).

http://dx.doi.org/10.1016/j.inteco.2014.07.004
2110-7017/

Please cite this article as: Presbitero AF, et al. Is labor flexibility a substitute to offshoring? Evidence from Italian manufacturing. International Economics (2014), http://dx.doi.org/10.1016/j.inteco.2014.07.004

competitors, or to move their production abroad. The need for improved competitiveness explains the stress international institutions like the OECD and the International Monetary Fund put on labor market reforms in the present financial crisis.[1] The threat of delocalization, by reinforcing the trade-off between job and employment security, is also a major driver in the political strive for labor market reforms (Esping-Andersen and Regini, 2000).[2] Indeed, the literature is quite concordant in finding a negative impact of globalization on employment protection (Fischer and Somogyi, 2012). But is the underlying presupposition that, with more rigid domestic labor markets, firms would move their production abroad valid? The literature has identified high domestic unit labor costs as one of the factors motivating firms' choice to delocalize, but little effort has been devoted to test at a microlevel whether more job stability fosters offshoring.[3] In particular, no connections have been established so far between the diffusion of flexible work arrangements by means of non-standard contracts and the likelihood of offshoring. Our work provides a first empirical assessment of this link at the firm level. A crucial difference between the macro- and the microperspective is that we focus on the actual use of non-standard contracts (at the microlevel) rather than on the availability of such arrangements, as measured for instance by the OECD employment protection legislation (EPL) index, which is defined at the macrolevel. Therefore, we do not need much variation in the amount of protection granted to workers for our empirical analysis: even in a constant institutional environment, we could exploit the heterogeneity in firms' behavior, and test whether individual firms consider cheap domestic labor as a substitute for cheap foreign labor. The season of labor market reforms that has occurred in the past two decades in OECD countries, which has opened the possibility to hire under less protected, temporary contracts (Berton et al., 2012), introduces additional variation (and interest) into our analysis. The share of temporary contracts (fixed term direct-hire employees) over dependent employment was 13.7% in the EU27 in 2009 (up from about 8% in 1980), with figures as high as 18% in the Netherlands, 22% in Portugal, 25.5% in Spain and 26.4% in Poland. Italy was about the EU average at 12.5%. This share skyrocketed to above 40% in the EU27 for younger workers in the 15–24 age bracket (France, Germany, Spain, Portugal and Sweden were at about 55%; Poland was at 62%; Italy at 44%).[4] Given the shorter duration of temporary contracts with respect to open-ended ones, the incidence of temporary contracts in hiring is even greater, with Spain reaching 80%. As in the past decades globalization has also increased (OECD, 2010), it is legitimate to ask whether the use of temporary workers acted as an amplifier or as a restrain to increased offshoring.

Intuitively, the impact of workforce composition on offshoring decisions is indeterminate. If firms consider production offshoring and workforce flexibility as two different cost-cutting strategies, then a higher share of temporary workers over total workforce should be associated with less delocalization. Indeed, non-standard contracts, and in particular fixed-term work arrangements, do entail lower dismissal costs (as no firing costs have to be paid upon expiration of the contract and in many countries no end-of-services allowances are due) and, in many countries, also lower unitary costs (Berton et al., 2012). The availability of such flexible work arrangements should therefore decrease the appeal of delocalization to countries with low labor costs. Conversely, higher workforce flexibility (in terms of a higher share of temporary workers) could facilitate offshoring, as domestic production can be displaced abroad without bearing the high costs of permanent workers dismissal. Such costs entail not only monetary payments to workers, but also increased opposition by labor unions and more attention from the general public and the media, which might delay offshoring or deter it completely.

[1] See for instance IMF (2012), Barkbu et al. (2012), and OECD (2012).

[2] While in principle workers (and unions) might be in favor of labor market deregulation if they anticipate a higher chance of finding a job once unemployed thanks to lower employment protection, most often they ask for more protection of existing jobs at risk of delocalization (see Berton et al., 2012).

[3] In this paper the term offshoring refers to the extent to which a firm performs part of its production abroad, either through the setting up of arm's length agreements with foreign firms (international outsourcing), such as licensing, or through the establishment of (partly or fully) owned subsidiaries or affiliates abroad (FDI).

[4] The crisis induced a decrease in the share of fixed-term contracts, as those were the first to be dismissed. The maximum was achieved, in most countries, in 2007.

Please cite this article as: Presbitero AF, et al. Is labor flexibility a substitute to offshoring? Evidence from Italian manufacturing. International Economics (2014), http://dx.doi.org/10.1016/j.inteco.2014.07.004

Therefore, the question whether labor market flexibility induces more or less offshoring has ultimately to be addressed at the empirical level. To the best of our knowledge, this paper is the first to test this claim with firm-level data. Our results show that offshoring and labor flexibility are negatively correlated. However, an issue can be raised concerning reverse causality (from a propensity to future offshoring to a preference over actual workforce composition) and spurious correlation (some firm characteristics affecting both the propensity to future offshoring and the actual workforce composition). Indeed, we show by using appropriate instruments that once this endogeneity problem is controlled for, the relationship between actual workforce composition and future offshoring vanishes (whether the theoretical mechanisms at work discussed above are too weak or compensate each other, we cannot tell).

The paper is structured as follows: the next section summarizes the literature on the determinants of offshoring and the wage gap of temporary workers; Section 3 describes our empirical strategy and Section 4 presents our main results. Finally, Section 5 summarizes and concludes.

2. Literature

The impact of offshoring on domestic labor force composition has been the focus of recent applied research. Machikita and Sato (2011) and Matsuura et al. (2011) find that foreign direct investment and/or outsourcing by Japanese firms tend to encourage the replacement of permanent workers with temporary workers. Using German data Görg and Görlich (2012) show that temporary workers are more affected by increasing offshoring in terms of wage reductions and higher probability of layoffs than permanent workers. This result may be consistent with the weak bargaining power of temporary workers and with manufacturers' goal to save expected labor adjustment costs. Once the firm has already incurred the setup cost for the foreign plant, more favorable foreign business opportunities can be dealt with by dismissing temporary rather than permanent workers. Moreover, tougher international competition may make the employment relationship fragile, reducing the workers' incentive to accumulate firm-specific skills. Hence, the efficiency advantage of permanent workers over temporary workers shrinks and firms prefer substituting permanent with temporary workers.[5]

Conversely, the determinants of offshoring have been extensively investigated, but to the best of our knowledge there are no studies that include labor-force composition among the explanatory variables.[6] In general, there is broad consensus that the choice to offshore is mainly driven by two

[5] More in general, the effects of offshoring on labor market outcomes have been extensively studied (see Crinò (2009) for a review). In a nutshell, offshoring may induce cost savings and improve productivity, resulting in higher output. Thanks to the productivity-enhancing effect of offshoring, even factors of production whose tasks are offshored can benefit from the international delocalization of production (Grossman and Rossi-Hansberg, 2008). The empirical evidence broadly supports this view (Görg et al., 2008; Daveri and Jona-Lasinio, 2008; Hijzen et al., 2010; Jabbour, 2010). However, higher productivity comes at the cost of higher demand elasticities for production workers (Sensen, 2010), increasing job instability (Geishecker, 2008; Lo Turco et al., 2013), broadening wage inequality due to the increase in the relative demand for skilled workers (Feenstra and Hanson, 1996,1999; Broccolini et al., 2011), and higher unemployment in presence of imperfect intersectoral labor mobility (Mitra and Ranjan, 2010). As for what concerns non-production workers, the effects of offshoring are reported to depend on the workers' skills (the demand for high skills increases, while that for low skills decreases), as well as on other characteristics of the foreign supplier (Tomiura et al. (2013), for Japanese firms).

[6] Working on Japanese firms Tomiura (2005) shows that offshorers are larger and more labor-intensive than purely domestic firms; moreover, they are more productive and perform more R&D. Similar results are found by Pelegrìn and Bolancé (2011) for Spanish firms. Hyun (2010) confirms, for Korean manufacturers, that offshoring is more frequent among firms that are larger, engage more in R&D, use more ICT, and have higher labor intensity, while he does not find an association with productivity. Using French data, Corcos et al. (2013) find that intra-firm imports are more likely among highly productive, capital-intensive and skill-intensive firms. The positive effect of productivity on offshoring decision for French firms is also confirmed by Defever and Toubal (2013). Using Italian data, Cusmano et al. (2010) show that foreign business experience, meaning that the firm has exported or undertaken FDI, being part of a business group and a large share of skilled workers are positively correlated with the probability to offshore. On a different sample of Italian firms, Capasso et al. (2013) show that offshoring is more likely among more productive and larger firms. Using a larger sample of European firms, Barba Navaretti et al. (2011a, 2011b) find that larger, older, more productive, innovative and foreign-owned firms, as well as those hiring more graduate and less blue-collar workers, are more likely to produce abroad than other firms. All these studies are based on cross sectional data and they reports contemporaneous correlations about some firms' characteristics and the likelihood to offshore. For evidence at the industry level, see, for instance, Antras (2003), Yeaple (2006) and Marin (2006).

Please cite this article as: Presbitero AF, et al. Is labor flexibility a substitute to offshoring? Evidence from Italian manufacturing. International Economics (2014), http://dx.doi.org/10.1016/j.inteco.2014.07.004

goals (OECD, 2007): (1) reducing production costs, and in particular labor costs, and (2) being in proximity to final markets, in order to increase sales. Between those two motivations, the existing evidence suggests that international outsourcing is primarily a cost-cutting strategy. The necessity to reduce production costs has been extensively discussed with respect to the internationalization of the commodity chains (Gereffi, 1999). In a comparative study on the international expansion strategies of European firms from Austria, France, Germany, Hungary, Italy, Spain and the UK, Barba Navaretti et al. (2011a) find that FDI is more frequently used to support sales in foreign markets (a market-seeking objective), whereas international outsourcing is predominantly used to delocalize production (an efficiency-seeking objective). In a seminal study targeted at identifying the main drivers of outsourcing (and offshoring) across 20 large European manufacturing groups, operational cost savings have been identified as a predominant concern (Quélin and Duhamel, 2003).[7] Dìaz-Mora (2008) finds that the offshoring intensity is higher in sectors with higher unit labor costs. Using firm-level data, Pelegrìn and Bolancé (2011) confirm the presence of cost-cutting strategies by offshoring firms, since firms with worse operating performance and labor-intensive activities are more likely to relocate part of their production abroad. Similarly, working on Italian firm-level data, Cusmano et al. (2010) and Capasso et al. (2013) argue that offshoring is mainly driven by cost-efficiency reasons, since most firms contract out labor intensive functions. That offshoring is mainly an efficiency-enhancing strategy for Italian firms is also supported by a comparison of the internationalization patterns of European firms from selected economies (Barba Navaretti et al., 2011a). The majority of Italian firms (60.5%) producing abroad choose international outsourcing (an efficiency-enhancing strategy) as an exclusive modality of international production (the highest percentage in the sample), while only 34% of them choose FDI (the lowest in the sample, similar to France).

An alternative to employing cheap labor abroad is to reduce the wage bill at home by using temporary contracts: this allows savings in terms of dismissal costs and – in many cases – also in terms of unit (wage) costs.[8] With respect to dismissal costs, temporary contracts permit a sort of "employment at will" behavior of firms, as workers can be freely dismissed when the contract expires, and contract durations are generally short (Berton et al., 2012).[9] Moreover, in many countries no dismissal costs are due to the worker upon expiration.[10] On the contrary, firing an open-ended worker generally requires a justification, which can be challenged by the worker and reversed by a labor court, with the whole process taking time and money and adding to uncertainty. The threat of taking the firm to the court often induces high voluntary dismissal payments even when they are not envisaged by the legislation (this being the case of Italy at the time our data refer to). Moreover, upon termination of the contract open-ended workers are often provided with end-of-service allowances.

The wage bill for non-standard contracts is also lower, as these contracts often entail lower social contributions and wages are also lower due to a weaker bargaining position of fixed-term workers. The European Commission estimates an average wage penalty for temporary contracts of 14.2% (European Commission, 2011). This average masks strong heterogeneity among contracts and among countries. For instance, in Germany temp agency workers appear to suffer from a more substantial penalty: Oberst et al. (2007) estimate a wage gap of 29% for 2005, while Jahn (2008), after controlling for observed and unobserved characteristics, places the penalty at 15–18%. By converse, the most discriminated category in Italy is that of project workers,[11] with a penalization of up to 25% in terms of net wage and up to 50% in terms of gross wage. On the contrary, temporary contracts (fixed-term

(*footnote continued*)

A related strand of literature discusses the determinants of outsourcing and production subcontracting (see, among others, Girma and Gorg, 2004; Holl, 2008; Jabbour 2013).

[7] A related strand of literature shows that labor and production costs affect the location choice decision of multinational firms; see, for instance, Disdier and Mayer (2004) and Jabbour (2012).

[8] Temporary contracts might also serve a screening purpose – see for instance Portugal and Varejão (2009). We do not consider here the differences in productivity between temporary and open-ended contracts (Dolado et al., 2012; Lotti and Viviano, 2012), which might compensate differences in labor costs. Note however that the same issue arises for workers in third countries where production is offshored.

[9] In facts, temporary contracts are less diffused in countries with a lower EPL for open-ended contracts, like the UK.

[10] Dismissal payments, proportional to accrued seniority, are envisaged in some countries (e.g. France and Spain).

[11] Wage and salary independent contractors in US parlance.

Please cite this article as: Presbitero AF, et al. Is labor flexibility a substitute to offshoring? Evidence from Italian manufacturing. International Economics (2014), http://dx.doi.org/10.1016/j.inteco.2014.07.004

direct hires) – the focus of our analysis – entail little or no wage discrimination and differ from open-ended contacts only insofar as they are characterized, as discussed above, by reduced dismissal costs (Berton et al., 2012).

3. Data and identification strategy

The data we use in the empirical analysis are drawn from the IX and X "Survey on Manufacturing Firm" (SMF) administered every three years by Unicredit, a large banking group. The SMF is a large survey of about 3800 Italian manufacturing firms with more than 10 employees and includes several information on firms' internationalization and labor force composition over a 3-year period. As common in the literature (Cusmano et al., 2010; Hyun, 2010; Capasso et al., 2013; Corcos et al., 2013), we classify firms using a binary variable that identifies offshorers as the firms who explicitly state that they perform part of their production process abroad.[12] As for labor force composition, the SMF provides detailed information on the number of temporary and project workers at the firm level. The sampling procedure creates a rotating panel so that around one-third of firms interviewed in 2003 are still present in the 2006 wave. This limits the sample of firms present in both waves to about 1300. Missing data and outliers in the main variables used in the analysis leave use with a trimmed data set of 926 firms, observed both in 2003 and in 2006.[13]

A first look at the data of the X Survey on Manufacturing Firms confirms some of the indications of the empirical literature about the drivers of offshoring. Firms' choice to delocalize primarily follows a cost-cutting strategy, since lower labor and input costs are indicated by, respectively, 49% and 21% of offshoring firms as a main driver of delocalization decisions (22% of firms indicated proximity to the output markets as another driver of offshoring). A descriptive analysis of the data reinforces the opinion that domestic labor force flexibility and offshoring are substitutes, rather than complements (Fig. 1). The variable on the vertical axes is respectively the share of firms that undertake part of their production abroad in 2006 ($OFFSHORING_{2006}$, left hand panel), and the share of firms who chose to relocate part of their production abroad in the period 2003–2006 (right hand panel).[14] The variable on the horizontal axes is the share of temporary workers in 2003 (by deciles). Both diagrams show a negative correlation between offshoring and temporary workers.

To identify the effect of labor flexibility on the firms' decision to offshore beyond this descriptive evidence, we estimate a model in which the probability of offshoring in 2006 ($OFFSHORING_{2006}$) is a function of the offshoring status in the previous wave ($OFFSHORING_{2003}$), of the ratio of fixed-term direct-hire employees over the total number of dependent employees ($TEMPORARY_{2003}$), and of a set of control variables measured in 2003 (X_{2003}) in order to attenuate reverse causality and to allow for possible lagged effect on the decision to offshore:

$$\Pr(OFFSHORING_{2006} = 1) = \Phi(OFFSHORING_{2003}, TEMPORARY_{2003}, X_{2003}) \quad (1)$$

where Φ is the normal distribution function. The set of controls is based on the evidence about the determinants of offshoring (see footnote 6) and includes firm size (*SIZE*, as the logarithm of the number of employees in 2003), two dummies for innovative (*INNOVATION*, equal to one for firms which introduced a product or a process innovation between 2001 and 2003) and exporting (*EXPORT*) firms, a dummy for firms with a contraction in total sales between 2001 and 2003 (*NEGATIVE SALES*), and an index of skill intensity, measured as the share of white collars (non-production workers) in

[12] The specific question is: "Does the firm currently undertake part of its production activity in another country?" The survey does not provide a measure for the intensity of offshoring.

[13] Data on the XI survey are not publicly available and hence we cannot merge them to our data set. Even if we could, adding a new wave would create two problems. First, due to the rotating structure of the panel (and firm mortality), focusing on firms observed in all three waves (a 9-year period) would further diminish sample size. Second, the relationship between offshoring and temporary workers in the last wave is likely to be affected by the Great Recession, as temporary workers were the first to be laid off.

[14] To be more precise, the outcome variable in the right panel can take a value of +1 if the firm had offshore activities in 2006 but not in 2003, a value of 0 if the firm either had offshore activities both in 2006 and in 2003, or neither in 2006 nor in 2003, and a value of −1 if the firm had offshore activities in 2003 but not in 2006.

Please cite this article as: Presbitero AF, et al. Is labor flexibility a substitute to offshoring? Evidence from Italian manufacturing. International Economics (2014), http://dx.doi.org/10.1016/j.inteco.2014.07.004

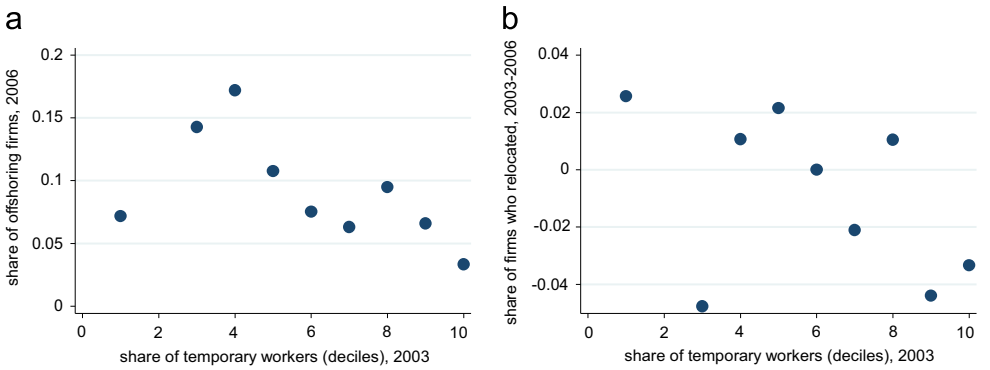

Fig. 1. Aggregate relationship between offshoring and labor force flexibility: (a) firms with offshoring activities in 2006 and (b) firms who relocated in 2003–2006. *Note*: First and second deciles of the share of temporary workers are both 0; they are thus grouped in the figures. The average value of the share of temporary workers for firms belonging to the decile 3 to 10 are respectively 0.9%, 1.9%, 3.0%, 4.4%, 6.3%, 8.7%, 12.4%, and 40.4%. The outcome variable in the right panel can take a value of 1 if the firm had offshore activities in 2006 but not in 2003, a value of 0 if the firm either had offshore activities both in 2006 and in 2003, or neither in 2006 nor in 2003, and a value of -1 if the firm had offshore activities in 2003 but not in 2006.
Source: Our elaboration on Survey on Manufacturing Firm (SMF) data, IX and X waves.

firm's total employment (*SKILL INTENSITY*).[15] To control for unobserved heterogeneity and for the presence of common shocks that may push firms working in the same region and/or industry towards offshoring and/or labor cost cutting (e.g. increasing the use of temporary workers), and to allow for the possibility that agglomeration effects and herd behavior might drive firms' offshoring decisions in local areas, we also add macro region (North-West, North-East, and Centre-South) times industry dummies. Unfortunately, the structure of the data set does not allow for a greater degree of granularity (e.g. region times industry dummies), as this would imply that many cells would be empty (no variation in the dependent variable). Definitions and descriptive statistics of the variables used in the analysis are reported in Table 1.

The descriptive statistics tell us that 9% of Italian firms delocalized part of their activities in 2006.[16] Offshoring status could be reversed (36.5% of offshoring firms in 2003 have foreign production in 2006), and it is more likely for firms that in 2003 were larger, exporters and innovative. Moreover, delocalization is more frequent among firms with a larger presence of white collars, and with easier access to credit and multiple banking relationships. Offshoring is also more likely amongst worse performers (e.g. firms that experienced a contraction of total sales between 2001 and 2003), a fact consistent with the choice of offshoring as driven by cost savings purposes. Finally, as described in Fig. 1, firms that employed a larger share of temporary and flexible workers in 2003 were less likely to offshore in 2006. These differences in the average probability of offshoring across firm's characteristics are generally statistically significant.

We start estimating Eq. (1) by a standard probit and a linear probability model. However, the model could suffer from simultaneity and omitted variable biases. Even if the labor market flexibility variable is predetermined, it could still be endogenous to the firms' offshoring propensity. In fact, the decision to delocalize part of the production process abroad in the near future could affect the current composition of the labor force. This may result in an increase of the share of flexible contracts, to facilitate the future offshoring process, or to a reduction of temporary workers, if firms see the expected delocalization as a cost-cutting strategy alternative to flexibilization (Pelegrìn and Bolancé, 2011; Capasso et al., 2013). This case is consistent with the firms' own statements about the reasons why they offshore, with the descriptive analysis of the data (Table 1), and with the lower relative demand by offshoring firms for unskilled labor (Head and Ries, 2002; Hijzen et al., 2005; Becker et al.,

[15] As Benfratello et al. (2009), who also use data from the SMF, we are not able to control for firm's productivity. However, we test the robustness of our findings across alternative specification of the model, see the Appendix.

[16] This number is not far from the data reported by Barba Navaretti et al. (2011a) using EFIGE data referred to 2008, according to which 6.2% of Italian firms were involved in international outsourcing or FDIs.

Please cite this article as: Presbitero AF, et al. Is labor flexibility a substitute to offshoring? Evidence from Italian manufacturing. International Economics (2014), http://dx.doi.org/10.1016/j.inteco.2014.07.004

Table 1
Variables' definitions and descriptive statistics.

Variables	Description	Mean			# obs.
Dependent variable					
OFFSHORING$_{2006}$ (0,1)	Dummy equal to one if the firm has declared to perform abroad part of his activities in 2006, zero otherwise.	0.090			926
		OFFSHORING$_{2006}$		*T*-test	
Explanatory variables		Yes	No	(one tail)	
OFFSHORING$_{2003}$ (0,1)	Dummy equal to one if the firm has declared to perform abroad part of his activities in 2003, zero otherwise.	0.365	0.069	***	926
TEMPORARY$_{2003}$	Share of fixed-term direct-hire employees over total dependent employees, in 2003.	0.017	0.041	**	926
TEMPORARY & PROJECT$_{2003}$	Share of fixed-term direct-hire employees and project workers over total dependent employees, in 2003.	0.042	0.080	**	916
EXPORT$_{2003}$ (0,1)	Dummy equal to one if the firm exported abroad part of his production in 2003, zero otherwise.	0.906	0.806	**	926
INNOVATION$_{2003}$ (0,1)	Dummy equal to one if the firm has introduced a product and/or process innovation in the period 2001-2003, zero otherwise.	0.659	0.644		926
SIZE$_{2003}$	Logarithm of the number of employees, excluding term contract workers, in 2003.	4.781	4.354	***	926
SKILL INTENSITY$_{2003}$	Share of white collars employees over the total number of employees, in 2003.	0.377	0.329	***	926
NEGATIVE SALES$_{2003}$ (0,1)	Dummy equal to one if the firm has a negative variation in sales between 2005 and 2003	0.447	0.341	**	926
AGE$_{2003}$	Logarithm of firm's years since inception, in 2003.	3.182	3.176		909
CREDIT RATIONED$_{2003}$	Dummy equal to one if the firm has applied to bank credit but its request has been declined, in 2003, zero otherwise.	0.106	0.126	**	919
MULTIPLE LENDING$_{2003}$	The number of banks with which the firm does business, in 2003.	7.612	6.296	***	920
FAMILY FIRM$_{2006}$	Dummy equal to one if the firm is family owned, in 2006, zero otherwise.	0.639	0.623		915
GROUP$_{2003}$	Dummy equal to one if the firm is part of a business group, in 2003, zero otherwise.	0.506	0.352	***	925
R&D INVESTMENT$_{2003}$	Dummy equal to one if the firm made, in 2001-2003, expenditures for R&D activities, zero otherwise.	0.671	0.542	***	924
Instrumental variables					
TEMPORARY PROV	Share of temporary workers (fixed-term dependent employees and project workers) over the total dependent employees, at the provincial level, in 2002. Source: Italian Social Security Administration (INPS)	0.157			94
MIGRANTS PROV	Share of foreign resident population over total resident population at the provincial level in 2002. Source: Italian Statistical Office (ISTAT).	0.013			94

Notes: our elaboration on Survey on Manufacturing Firm (SMF) data, IX and X waves. The third and fourth columns report the average values of the explanatory variables (by row) for firms that, respectively, are offshorers and do not delocalize in 2006 (*OFFSHORING*$_{2006}$). The fifth column reports the p-value of a (one-sided) t-test of a mean-comparison test. Data on instrumental variables originally refer to the 103 Italian administrative provinces, as were in 2002, but actual figures are based on 94 provinces, since provinces are aggregated to the old classification of 95 provinces and one province (Enna) is not represented in the final SMF data set used in the analysis.

* Significant at 10%.
** Significant at 5%.
*** Significant at 1%.

2012), where temporary workers are relatively more present. Under this scenario, the OLS estimates would be negatively biased. Second, it is possible that both offshoring and labor force flexibility are jointly driven by other unobserved factors, such as the degree of market competition.

To address these problems we rely on IV techniques. In absence of firm-level variables which could affect the composition of the labor force, but not the decision to delocalize part of the production, we instrument the share of temporary workers with aggregate measures of labor flexibility at the provincial level. This choice is motivated by the fact that aggregate indicators are likely to be exogenous with respect to firm-specific offshoring status. A similar strategy is followed by Jabbour (2013), who identifies the effect of productivity on the likelihood to outsource in a sample of French firms taking industry-level variables as instruments for the firm-specific level of productivity.

In particular, we instrument *TEMPORARY* with: (1) the share of temporary over total dependent employees at the provincial level in 2002 (*TEMPORARY PROV*)[17] and (2) the share of foreign resident population over total resident population at the provincial level in 2002 (*MIGRANTS PROV*).

Relevance of the *TEMPORARY PROV* instrument is based on the hypothesis that the more widespread are temporary contracts in the local labor market (which we measure at the provincial level), the more likely it is that the strategy of employing cheap and flexible domestic labor force is perceived as viable by an individual firm. As a mental experiment, suppose that the local labor market was made only of permanent (open-ended) workers: if a firm opened a new vacancy for a temporary job, that vacancy would probably remained unfilled, or it would be filled only at a higher wage (disgruntlement by unions could also be stronger). Also, dualization of the labor force as measured by the persistence in the type of contract workers can get in the labor market (Berton et al., 2011) implies that a higher share of temporary workers is equivalent to a larger pool from which firms can fish. The fact that the instrument is measured in 2002 and the firm's share of temporary workers refers to 2003 reinforces its relevance. On the other hand, the exogeneity of *TEMPORARY PROV* is based on the level of aggregation and on the time lag between the year when the provincial share is measured and the year in which we observe the firm's offshoring status: we deem it unlikely that the delocalization strategy and the employment policy of an individual firm affect the share of temporary workers in the whole province, considering all sectors.[18]

Similar considerations can be made for the provincial share of migrants. Its relevance is based on the fact that migrants are more likely to hold an open-ended job with respect to natives: 72.0% versus 64.8% among dependent employment (Fondazione Moressa, 2011).[19] Hence, firms would be more likely to assume temporary workers, other things equal, in provinces where migrants are less present than in provinces where the share of migrants is higher. However, the exogeneity assumption is more challenging, as migrants could be substitute for offshoring (Ottaviano et al., 2013) and their presence in the province could allow firms to reduce their labor cost and overcome the fixed cost of offshoring. A first insight about the validity of *MIGRANTS PROV* as instrument is its very low correlation with the share of offshoring firms at provincial level (0.04, not statistically significant). In addition, as for *TEMPORARY PROV*, the choice of measuring the variable at the provincial level and the timing attenuate the potential endogeneity of the provincial share of migrants. In particular, the number of foreign residents started increasing significantly since 2003 after a change of immigration policies in Italy that occurred in September 2002, making unlikely that the share of migrants in the province in 2002 affects the firm' future decision to offshore in 2006.

We are aware of the concerns about the potential weakness and invalidity of the instruments, especially when they are not grounded in a solid theoretical framework, as in our case (Bazzi and

[17] Italian Social Security Administration (INPS) data. We thank Fabio Berton for providing the computation.

[18] The small dimension of Italian firms, with respect to international standards for developed countries, reinforces the argument. Our sample is made for 87% by small and medium-sized enterprises and the three largest firms in each province account, on average for less than 30% of total and temporary employment. In addition, the correlation between *TEMPORARY PROV* and the share of offshorers at the provincial level in 2006 is quite low (0.12) and not statistically significant, suggesting that the instrument can be safely considered as exogenous. However, in the robustness section we run two exercises to control for the possibility that the delocalization strategy of individual firms affects the labor force composition at the provincial level (see the Appendix).

[19] This is also due to a higher incidence of irregular work among immigrants, which partly substitutes temporary employment.

Please cite this article as: Presbitero AF, et al. Is labor flexibility a substitute to offshoring? Evidence from Italian manufacturing. International Economics (2014), http://dx.doi.org/10.1016/j.inteco.2014.07.004

Clemens, 2013).[20] Hence, we complement the economic justification for the choice of the instruments provided above, testing the statistical validity of the instruments in our empirical analysis. In particular, the choice of having two separate instruments allows us to explicitly test the hypothesis that the instruments do not belong to the offshoring equation. In Appendix, we further deepen the discussion of the IV strategy, as part of our robustness analysis.

Our preferred specification is a linear probability model estimated by two-stage least squares (2SLS), which has the advantage of providing diagnostic tests for over-identifying restrictions, under-identification, and weak identification.[21] Additionally, we report the results of the estimation of a probit model with endogenous regressors by maximum likelihood.

4. Results

The main results of the estimation of Eq. (1) are reported in Table 2. The OLS and the probit estimates (columns 1 and 2) confirm the negative correlation between labor flexibility and offshoring, as shown in Fig. 1. This negative correlation is coherent with the evidence about offshoring determining an increase in the demand for skilled labor and a decrease in the demand for unskilled labor, given that temporary jobs are more associated with unskilled labor.[22]

However, once we take into account the possible endogeneity of the labor force composition, the coefficient on *TEMPORARY* becomes positive but it is no more statistically significant (columns 4 and 6). This result lends support to the presence of a negative bias of the OLS, consistent with offshoring firms reducing the demand for unskilled labor. Hence, the negative correlation between labor force flexibility and the subsequent propensity to offshore does not imply a causal link going from the former to the latter, neither the presence of a substitution effect between labor flexibility and offshoring. More formally, the IV estimates do not reject the null hypothesis that labor flexibility has no effect on the propensity to offshoring.

The first stage regressions and a battery of diagnostic tests suggest that the model is not mis-specified. The first stage regressions of the 2SLS (column 3) and probit model with endogenous regressors (column 5) show that the instruments are strongly correlated with the endogenous variables. The share of temporary workers in the province and the share of migrants in the total provincial population are, respectively, positively and negatively correlated with *TEMPORARY*, as expected. Coming to the 2SLS diagnostic tests, the Kleibergen–Paap rk Wald *F*-statistic is equal to 9.0, very close to the Staiger and Stock (1997) rule of thumb value of 10, and between the Stock and Yogo (2005) 5% critical values for 10% and 15% maximum bias. This is evidence against the risk of a weakly identified model. The instruments satisfy the rank condition, since the Kleibergen–Paap rk LM statistic rejects the null hypothesis that the equation is underidentified. Finally, the exclusion restrictions are satisfied, since the Sargan–Hansen test of overidentifying restrictions (OIR) does not reject the null hypothesis that the instruments are uncorrelated with the error term.

The control variables are generally significant and with the expected signs. The fragmentation of production is a long-term strategy: the probability to offshoring in 2006 is 25 percent higher for firms which have already delocalized their production process in 2003 than for firms which produced only

[20] We tried several different variables – at firm, industry, and provincial level – which may be candidate for being good instruments. In particular, we used firms' age, a dummy for firms which fired at least one employee in 2003, the share of temporary workers at regional and industry (2-digit) level, the provincial youth unemployment rate, a provincial measure of human capital stock, the ratio of labor force aged 15–34 over labor force aged 35–64 at the provincial level, the provincial participation rates in the labor market of individuals aged 15–24, 15–34 and 25–34. All these variables proved to be bad instruments, either because they do not satisfy the relevance or the exogeneity conditions.

[21] The Sargan–Hansen test of overidentifying restrictions (OIR) tests the null hypothesis that the instruments are uncorrelated with the error term. The Kleibergen–Paap rk LM statistic tests the null hypothesis that the excluded instruments are not correlated with the endogenous regressors (i.e. the equation is underidentified). The Kleibergen–Paap rk Wald *F*-statistic tests for weak identification (Baum et al., 2010).

[22] In 2003, the year when we measure employment composition, 60.5% of temporary workers had less than secondary education, against 41.6% of workers with an open-ended contract; 6.7% of temporary workers hold a university degree, against 12.5% of workers with an open-ended contract (Italian Labor Force Survey data).

Please cite this article as: Presbitero AF, et al. Is labor flexibility a substitute to offshoring? Evidence from Italian manufacturing. International Economics (2014), http://dx.doi.org/10.1016/j.inteco.2014.07.004

domestically (according to estimates reported in column 4), a result consistent with the descriptive statistics (Table 1) and with the literature pointing out the fixed costs of delocalization (Tomiura, 2005; Dìaz-Mora, 2008; Hyun, 2010; Jabbour, 2013).[23]

While firm size is usually a good predictor of firm's internationalization, the coefficient on *SIZE* is significant only in the probit models, while not in the OLS and 2SLS estimates. This result, in line with the findings of Cusmano et al. (2010), may be due to the presence of the lagged *OFFSHORING* variable, since firm size is likely to be (almost) time invariant. In fact, in a static model the coefficient on *SIZE* is highly significant in all specifications (see the Appendix).

Offshoring is more likely to occur for firms with a larger share of white collars, consistently with a greater presence of offshoring among firms in skill-intensive sectors (Dìaz-Mora, 2008; Cusmano et al., 2010; Pelegrìn and Bolancé, 2011; Corcos et al., 2013). In addition, the choice to delocalize is more frequent among firms who were experiencing a negative performance in terms of sales, suggesting that offshoring may be driven by the need to reduce production costs to gain competitiveness.

In contrast with the main finding discussed by the firms' internationalization literature (Tomiura, 2005; Dìaz-Mora, 2008; Barba Navaretti et al., 2008; Hyun, 2010; Cusmano et al., 2010), export-oriented and innovative firms are not statistically more likely to delocalize the production process than other firms. However, when considering contemporaneous rather than lagged values, we again find evidence supporting the stylized facts that exporting and innovative firms are more likely to offshore than firms which sell all their production in Italy and do not introduce product or process innovations.[24]

In the online Appendix we show a battery of additional exercises to test the validity of our main findings. In particular, results are robust to: (1) the estimation of a static version of Eq. (1) excluding $OFFSHORING_{2003}$, which should be less subject to autocorrelation problems in the error term; (2) an alternative definition of *TEMPORARY*, including also project workers; (3) the inclusion of a series of additional control variables, potentially correlated with the offshoring decisions (i.e. firm's age, a dummy for credit rationed firms, the number of banking relationships, a dummy for investment in R&D as alternative measure of innovation, a dummy for firms belonging to groups, a dummy for family owned businesses); (4) the inclusion of regional dummies; (5) the distinction between low- and high-tech industries; (6) the exclusion of influential provinces and large firms, whose offshoring strategies may affect the local demand for temporary workers; and (7) an IV estimation with exact identification, in which we allow for a slight relaxation of the exclusion restriction.

5. Concluding remarks

The fragmentation of production processes and an increasing flexibility of the labor force are two growing features of the global economy. As the initial quotation suggests, the threat of delocalization is often used in policy circles to promote labor market reforms. In this paper, we take Italy as a representative case study to assess whether the use of a more flexible labor force is indeed a substitute to offshoring, or whether it further enhances delocalization. Firms engaging in offshoring are generally moved by cost-savings reasons and by the necessity to be closer to new potential markets. The replacement of permanent with temporary workers, made possible by recent legislative reforms in the Italian labor markets, could partially offset the potential advantages of offshoring, reducing in particular dismissal costs and increasing numerical flexibility. Alternatively, a more flexible occupational mix could make it easier to substitute domestic with foreign labor, making easier to firms to reap the potential benefits of offshoring opportunities.

The estimation of a model aimed at explaining the firm's propensity to offshore, based on a representative sample of Italian manufacturers, shows that there is a negative correlation between

[23] Jabbour (2013), in particular, uses panel data to uncover that current outsourcing critically depends on past outsourcing; the decision to relocate part of the production process being a long-term strategy because of the associated fixed-costs.

[24] Results are not shown for the sake of brevity, but they are discussed in a previous version of the paper (Presbitero et al., 2012).

Please cite this article as: Presbitero AF, et al. Is labor flexibility a substitute to offshoring? Evidence from Italian manufacturing. International Economics (2014), http://dx.doi.org/10.1016/j.inteco.2014.07.004

Table 2
Regression results: dynamic model.

Dep. Var.: *OFFSHORING*$_{2006}$	(1) OLS	(2) PROBIT	(3) 1st stage	(4) 2SLS	(5) 1st stage	(6) IVPROBIT
OFFSHORING$_{2003}$	0.258***	0.986***	0.022	0.253***	0.022	0.859***
	[0.048]	[0.164]	[0.015]	[0.052]	[0.015]	[0.275]
EXPORT$_{2003}$	0.028	0.302	0.007	0.026	0.007	0.263
	[0.022]	[0.234]	[0.011]	[0.023]	[0.011]	[0.269]
INNOVATION$_{2003}$	−0.017	−0.096	0.005	−0.018	0.005	−0.099
	[0.015]	[0.096]	[0.009]	[0.015]	[0.009]	[0.077]
SKILL INTENSITY$_{2003}$	0.101*	0.746**	−0.049**	0.112*	−0.049***	0.850***
	[0.053]	[0.292]	[0.018]	[0.059]	[0.018]	[0.264]
SIZE$_{2003}$	0.014	0.121**	−0.004	0.015	−0.004	0.126***
	[0.010]	[0.050]	[0.003]	[0.009]	[0.003]	[0.046]
NEGATIVE SALES$_{2003}$	0.032*	0.235***	0.003	0.032**	0.003	0.215*
	[0.016]	[0.089]	[0.011]	[0.015]	[0.011]	[0.114]
TEMPORARY$_{2003}$	−0.146***	−2.262***		0.086		0.874
	[0.034]	[0.582]		[0.540]		[3.216]
MIGRANTS PROV			−1.030**		−1.095***	
			[0.428]		[0.370]	
TEMPORARY PROV			0.439***		0.435***	
			[0.104]		[0.107]	
Observations	926	926	926	926	926	926
R^2	0.111		0.026	0.080		
Overidentification				0.497		
Underidentification				0.059		
Weak instrument				8.980		

Notes: The table reports the coefficients and, in brackets, the associated standard errors clustered by region. At the bottom of the table we report some diagnostic tests. In particular, for the 2SLS we report the p-value of: (1) the Sargan-Hansen test of overidentifying restrictions (OIR) testing the null hypothesis that the instruments are uncorrelated with the error term; (2) the Kleibergen–Paap rk LM-statistic testing the null hypothesis that the excluded instruments are not correlated with the endogenous regressor; and (3) the Kleibergen–Paap rk Wald F-statistic testing for weak identification. All regressions include macro-area x industry dummies, and a constant, not shown for reasons of space.

* Significant at 10%.

** Significant at 5%.

*** Significant at 1%.

labor flexibility and offshoring, suggesting that the two phenomena are substitute rather than complements. However, the OLS estimates are likely to be negatively biased. The cost-saving strategies driving offshoring firms reduce the relative demand for unskilled tasks, where temporary jobs are concentrated, and may introduce a negative correlation between the current labor force composition and the future delocalization choice. Once we control for the endogeneity of the share of temporary workers and for spurious correlation, we find that the share of temporary workers does no more contribute to explain the firms' propensity to offshoring. This means that the negative correlation between labor flexibility and subsequent delocalization observed in the data (Fig. 1) cannot be interpreted as causation. More precisely, we cannot reject the null hypothesis that labor flexibility has no effect on the propensity to offshoring. We test the validity of our results using the Kraay's (2012) Bayesian approach to build confidence intervals for instrumental variable regressions with weak exclusion restrictions. While we recognize that our paper does not provide a definitive result, we believe it significantly contributes to the literature and to the policy discussion.

In conclusions, our results suggest that, on the basis of the available evidence, we should not bother too much about the interaction between labor force flexibility and offshoring decisions, though we have to leave to future research the question whether the opposed theoretical mechanisms at work (smaller delocalization costs and less union opposition to offshoring, but also lower cost saving opportunities with a higher share of temporary workers) are too weak or compensate each other. An implication of our research is that political support for labor market reforms aimed at further liberalizing the labor market should not be sought after on the implicit threat that firms would

Please cite this article as: Presbitero AF, et al. Is labor flexibility a substitute to offshoring? Evidence from Italian manufacturing. International Economics (2014), http://dx.doi.org/10.1016/j.inteco.2014.07.004

otherwise relocate their production abroad. According to our estimates, a solid argument that labor flexibility and offshoring are substitutes has still to be made.

Acknowledgments

The authors thank Nicola Coniglio (the editor), two anonymous referees, Luigi Benfratello, Matteo Picchio, Stefano Staffolani, Alberto Zazzaro and participants to the workshop "I cambiamenti della manifattura italiana visti attraverso l'indagine Unicredit" (Centro Studi Luca d'Agliano, 2010), to the 51st annual meeting of the Italian Economic Association (Catania, 2010), to the ITSG international workshop (Trento, 2012), and to the AIEL-ITSG Conference on "International trade and labor markets" (Padova, 2013) for helpful comments on an earlier version of this paper. The views expressed herein are those of the authors and should not be attributed to the IMF, its Executive Board, or its management.

Appendix A. Supporting information

Supplementary data associated with this article can be found in the online version at http://dx.doi.org/10.1016/j.inteco.2014.07.004.

References

Antras P. Firms, contracts, and trade structure. Q J Econ 2003;118(4):1375–18.
Barba Navaretti, G, Bugamelli, M, Schivardi, F, Altomonte, C, Horgos, D, Maggioni D. The global operations of European firms – the second EFIGE policy report. Bruegel blueprint series, no. 12; 2011a.
Barba Navaretti G, Bertola G, Sembenelli A. Offshoring and immigrant employment: firm-level theory and evidence. CEPR discussion papers, no. 6743; 2011b.
Barkbu B, Rahman J, Valdés R.. Fostering growth in Europe now. IMF staff discussion note no. 12/17; 2012.
Baum CF, Schaffer ME, Stillman S. ivreg2: stata module for extended instrumental variables/2SLS, GMM and AC/HAC, LIML and *k*-class regression. Technical report; 2010. Available online at: ⟨ideas.repec.org/c/boc/bocode/s425401.html⟩.
Bazzi S, Clemens MA. Blunt instruments: avoiding common pitfalls in identifying the causes of economic growth. Am Econ J Macroecon 2013;5(2):152–86.
Becker SO, Ekholm K, Muendler M-A. Offshoring and the onshore composition of tasks and skills. J Int Econ 2012;90(1):91–106.
Benfratello L, Razzolini T, Sembenelli A. Does ICT investment spur or hamper offshoring? Empirical evidence from microdata. Development Working Papers 276, Centro Studi Luca d'Agliano, University of Milano; 2009.
Berton F, Devicienti F, Pacelli L. Are temporary jobs a port of entry into permanent employment? Evidence from matched employer–employee data. Int J Manpower 2011;32(8):879–99.
Berton F, Richiardi M, Sacchi S. The political economy of work security and flexibility: Italy in comparative perspective. Bristol: Policy Press; 2012.
Broccolini C, Lo Turco A, Presbitero AF, Staffolani S. Individual earnings, international outsourcing and technological change. Int Econ J 2011;25(1):29–46.
Capasso M, Cusmano L, Morrison A. The determinants of outsourcing and offshoring strategies in industrial districts: evidence from Italy. Reg Stud 2013;47(4):465–79.
Corcos G, Irac DM, Mion G, Verdier T. The determinants of intrafirm trade: evidence from French firms. Rev Econ Stat 2013;95(3):825–38.
Crinò R. Offshoring, multinationals and labour market: a review of the empirical literature. J Econ Surv 2009;23(2):197–249.
Cusmano L, Mancusi ML, Morrison A. Globalization of production and innovation: how outsourcing is reshaping an advanced manufacturing area. Reg Stud 2010;44(3):235–52.
Daveri F, Jona-Lasinio C. Off-shoring and productivity growth in the Italian manufacturing industries. CESifo Econ Stud 2008;54(3):414–50.
Defever F, Toubal F. Productivity, relationship-specific inputs and the sourcing modes of multinationals. J Econ Behav Organ 2013;94:345–57.
Dìaz-Mora C. What factors determine the outsourcing intensity? A dynamic panel data approach for manufacturing industries. Appl Econ 2008;40(19):2509–21.
Disdier AC, Mayer T. How different is eastern Europe? Structure and determinants of location choices by french firms in eastern and western Europe. J Comp Econ 2004;32:280–96.
Dolado JJ, Ortigueira S, Stucchi R. Does dual employment protection affect TFP? Evidence from Spanish manufacturing firms, CEPR Discussion Papers 8763; 2012.
Esping-Andersen G, Regini M, editors. Why deregulate labour markets?Oxford: Oxford University Press; 2000.
European Commission. Employment in Europe, 2010 ed. Luxembourg: Publication Office of the European Union; 2011.
Feenstra RC, Hanson GH. Globalization, outsourcing, and wage inequality. Am Econ Rev 1996;86(2):240–5.

Please cite this article as: Presbitero AF, et al. Is labor flexibility a substitute to offshoring? Evidence from Italian manufacturing. International Economics (2014), http://dx.doi.org/10.1016/j.inteco.2014.07.004

Feenstra RC, Hanson GH. The impact of outsourcing and high-technology capital on wages: estimates for the United States, 1979–1990. Q J Econ 1999;114(3):907–40.
Fischer JAV, Somogyi F. Globalization and protection of employment. MPRA paper no. 39426; 2012.
Fondazione Moressa. La condizione occupazionale dei giovani stranieri. Mestre: Fondazione Moressa; 2011.
Geishecker I. The impact of international outsourcing on individual employment security: a micro-level analysis. Labour Econ 2008;15(3):291–14.
Gereffi G. International trade and industrial upgrading in the apparel commodity chain. J Int Econ 1999;48(1):37–60.
Girma S, Gorg H. Outsourcing, foreign ownership, and productivity: evidence from UK establishment-level data. Rev Int Econ 2004;12(5):817–32.
Görg H, Hanley A, Strobl E. Productivity effects of international outsourcing: evidence from plant-level data. Can J Econ 2008;41 (2):670–88.
Görg, H, Görlich, D. Offshoring, wages and job security of temporary workers. IZA discussion paper, no. 6897; 2012.
Grossman GM, Rossi-Hansberg E. Trading tasks: a simple theory of offshoring. Am Econ Rev 2008;98(5):1978–97.
Head K, Ries J. Offshore production and skill upgrading by Japanese manufacturing firms. J Int Econ 2002;58(1): 81–105.
Hijzen A, Görg H, Hine RC. International outsourcing and the skill structure of labour demand in the United Kingdom. Econ J 2005;115(506):860–78.
Hijzen A, Inui T, Todo Y. Does offshoring pay? Firm-level evidence from Japan. Econ Inq 2010;48(4):880–95.
Holl A. Production subcontracting and location. Reg Sci Urban Econ 2008;38(3):299–309.
Hyun H-J. Firm heterogeneity in the choice of offshoring: evidence from Korean manufacturing firms. Asian Econ Pap 2010;9(1): 157–78.
Jabbour L. Offshoring and firm performance: evidence from french manufacturing industry. World Econ 2010;33(3):507–24.
Jabbour L. 'Slicing the value chain' internationally: empirical evidence on the offshoring strategy by French firms. World Econ 2012;35(11):1417–47.
Jabbour L. Market thickness, sunk costs, productivity, and the outsourcing decision: an empirical analysis of manufacturing firms in France. Can J Econ 2013;46(1):103–34.
Jahn EJ. Reassessing the pay gap for temps in Germany. J Econ Stat 2008;230:208–33.
Kraay A. Instrumental variables regressions with uncertain exclusion restrictions: a Bayesian approach. J Appl Econom 2012;27 (1):108–28.
IMF. Euro area policies: 2012 article IV consultation. IMF country report no. 12/181; 2012.
Lo Turco A, Maggioni D, Picchio. Offshoring and job stability: evidence from Italian manufacturing. Struct Change Econ Dyn 2013;26:27–46.
Lotti F, Viviano E. Temporary workers, uncertainty and productivity. Paper available at ⟨http://www.sole-jole.org/13112.pdf⟩; 2012.
Machikita T, Sato H. Temporary jobs and globalization: evidence from Japan. RIETI discussion paper series, no. 11-E-029; 2011.
Matsuura, T, Sato, H, Wakasugi, R. Temporary workers, permanent workers, and international trade: evidence from Japanese firm-level data. RIETI discussion paper series, no. 11-E-30; 2011.
Marin D. A new international division of labor in Europe: outsourcing and offshoring to eastern Europe. J Eur Econ Assoc 2006;4 (2–3):612–22.
Mitra D, Ranjan P. Offshoring and unemployment: the role of search frictions labor mobility. J Int Econ 2010;81(2): 219–29.
Oberst M, Schank T, Schnabel C. Interne Arbeitsmärkte und Einsatz temporärer Arbeitsverhältniss: Eine Fallstudie mit Daten eines deutschen Dienstleistungsunternehmens. Z Betriebswirtsch 2007;77(11):1–19.
OECD. Offshoring and employment: trends and impact. Paris: OECD Publishing; 2007.
OECD. Measuring globalisation: OECD economic globalisation indicators. Paris: OECD Publishing; 2010.
OECD. Economic policy reforms 2012: going for growth. Paris: OECD Publishing; 2012.
Ottaviano G, Peri G, Wright GC. Immigration, offshoring, and American jobs. Am Econ Rev 2013;103(5):1925–59.
Pelegrìn A, Bolancé C. Offshoring and company characteristics: some evidence from the analysis of Spanish firm data. Institut d'Economia de Barcelona working papers no. 2011/16; 2011.
Portugal P, Varejão J. Why do firms use fixed-term contracts? IZA discussion paper series no. 4380; 2009.
Presbitero AF, Richiardi MG, Amighini A. Is labor flexibility a substitute to offshoring? Evidence from Italian manufacturing. MoFiR working paper, no. 72; 2012.
Quélin B, Duhamel F. Bringing together strategic outsourcing and corporate strategy: outsourcing motives and risks. Eur Manag J 2003;21(5):647–61.
Sapir A. Globalisation and the reform of European social models. J Common Market Stud 2006;44(2):369–90.
Sensen MZ. The effects of offshoring on the elasticity of labor demand. J Int Econ 2010;81(1):89–98.
Staiger D, Stock JH. Instrumental variables regression with weak instruments. Econometrica 1997;65(3):557–86.
Stock JH, Yogo M. Testing for weak instruments in linear IV regression. (chapter 5). In: Andrews DWK, Stock JH, editors. Identification and inference for econometric models: essays in honor of Thomas Rothenberg. Cambridge: Cambridge University Press; 2005. p. 80–108.
Tomiura E. Foreign outsourcing and firm-level characteristics: evidence form Japanese manufacturers. J Jpn Int Econ 2005;19 (2):255–71.
Tomiura E, Ito B, Wakasugi R. Offshoring outsourcing and production workers: firm-level relationships disaggregated by skills and suppliers. World Econ 2013;36(2):180–93.
Yeaple S. Offshoring, foreign direct investment and the structure of US trade. J Eur Econ Assoc 2006;4(2–3):602–11.

Please cite this article as: Presbitero AF, et al. Is labor flexibility a substitute to offshoring? Evidence from Italian manufacturing. International Economics (2014), http://dx.doi.org/10.1016/j.inteco.2014.07.004